COBRA 18R2

Creating and Uploading Automated Scripts

FINALE | FIREWORKS™

Design any size show using this market-leading visual choreography scripting software.

Use Microsoft Excel or any text editor to create a simple script file in seconds.

Frequently Asked Questions

After reading through the documentation, please refer back to this section to reference some important notes.

- Only if you are running version 2.1.0 or 2.1.1 on your 18R2, there is a limit to fire up to 2 channels at the same time within a 0.4s time period. **In our 3.0+ firmware versions, you can fire unlimited channels and cues at the same time**. All other subsequent scripts abide by the 2 channel restriction. You can learn more about [firmware upgrades](#) on our website.

- When exporting scripts from Finale Pro, the script time starts at the time the first cue is fired. Therefore, if you wish the script to begin at the time the music starts, we suggest you add a dummy cue at time = 0 in your show. For example, channel 99, cue 1. Or, simply let Finale assign the cue and leave this cue empty when wiring your show.

- In some cases, certain USB sticks are not recognized by the COBRA 18R2. If you place the USB stick into the 18R2 and it's not recognized (no LEDs turn on), we suggest trying a lower storage device such as 1 or 2GB. Walmart sells the Sandisk brand low storage drives which work great. Also note that in some cases you may need to restart the 18R2 for the USB stick to become recognized.

- When turning on the 18R2, by pressing and holding any buttons until the system has fully booted up, you will receive an Er3 code. This is a preventative check to ensure no keypad buttons are stuck or there any any shorts on the board that could cause for inadvertent system actions.

- You can always clear all scripts from the remote by importing a file with only the contents "end". Or, hold TEST and SYNC at the same time for 10 seconds to clear the scripts. Once finished, "00" will show on the channel display. Once cleared, re-start the 18R2.

- When saving the COBRA script file to the USB drive, make sure to name it cobra.csv. Any other name won't be recognized. When "Saving As" from Excel, choose type "Commas Separated Values (CSV)" and enter the word "cobra" without the quotes. The .csv extension will be added for you automatically.

Overview

The COBRA 18R2 supports the upload of up to 100 scripts which represent an automated firing sequence. Each script is assigned to a button and channel combination on the 18R2 remote to be triggered manually by the user. The following outlines the basic scripting features made available and detailed in this document.

- Upload up to 100 unique scripts with a maximum of 1,800 events across all scripts
- Fire events with 1/10th second accuracy
- Channel changes automatically between events on different channels
- Fire multiple cues at the same time
- Fire up to two channels at the same time within 0.4 seconds
- Manually change channel and fire cues while scripts are executing

Note: The 18R2 fires all cues in real-time while executing. Cobra uses a proprietary grid-fire overlapping technology which sends two separate overlapped 1-18 grids across two channels. The grids are sent as pulses that overlap with previous commands such to maintain high reliability at the fastest 1/10th second firing rate. This same technology also allows manual firing of cues while scripts are executing.

Hardware and Software Requirements

In order to create and execute scripts on the 18R2 remote, you'll need the following:

- COBRA 18R2 hand-held remote

- USB flash thumb drive

  Note: Available at any electronics store (e.g.www.amazon.com/dp/B001XURP7W). Storage capacity less than 2GB is more than sufficient.

- PC or Mac with Microsoft Excel
  Note: You can use any program capable of creating and saving a .csv file. Other options include OpenOffice, notepad, wordpad, or Google Docs.

- COBRA Wireless Re-programming Device (only required if upgrading older systems)
  Note: A re-programming device is only required if your current systems are running software for the 18R controller. You must upgrade your software to the new 2.0 version in order to allow the 18R2 and 18R to function with any 18M module.

How does it work?

The COBRA 18R2 has a USB port located on the right-hand side of the device. Once your script file is designed (see *Create an Example script File* below), you save it to a common USB flash drive and then plug the flash drive into the 18R2. The 18R2 will recognize and store the file within the 18R2 allowing you to remove the flash drive and operate the remote without being connected to a flash drive or computer. The file is always stored on the 18R2 even if you power down / replace batteries on the remote.

1. Create a .csv script file using Microsoft Excel or Finale Fireworks (see "Create an Example script File" below)

2. Save the .csv script file to a USB flash drive

3. Plug the USB flash drive into the COBRA 18R2 to upload the script

4. Review any errors displayed on the 18R2. Correct errors by repeating steps 1 and 2. If no errors are displayed, you are done and ready to execute your scripts. The 18R2 displays all green LEDs if the script load is successful and all red LEDs if the script load in unsuccessful.

5. Remove the USB flash drive and your ready to fire your show

Creating an Example Script File

COBRA gives you two options for creating a script file. If you are planning to use Finale Fireworks, we recommend you read *Option 1 Microsoft Excel Text Editor* such to understand the basics and format of the .csv file.
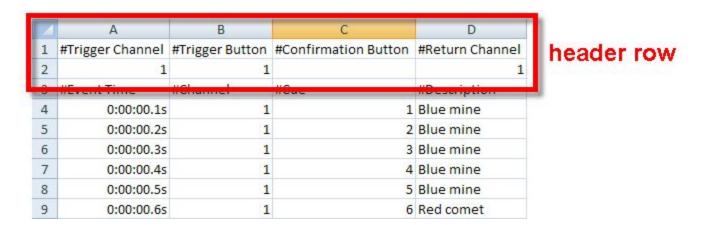
Option 1 Microsoft Excel / Text Editor: Use a common spreadsheet program such as Microsoft Excel or raw text editor such as Notepad to create and save a file that you will upload into your COBRA 18R2. See below for more details.

To understand the 18R2 format, let's begin by using Microsoft Excel to create a simple script for executing a fixed delay script of 0.1s from cues #1-6 on channel 01. When the operator has the 18R2 set to channel 01, and presses cue #1, an automatic script from cues #1-6 with a 0.1s delay is automatically executed shown and explained below.

	A	B	C	D
1	#Trigger Channel	#Trigger Button	#Confirmation Button	#Return Channel
2	1	1		1
3	#Event Time	#Channel	#Cue	#Description
4	0:00:00.1s	1	1	Blue mine
5	0:00:00.2s	1	2	Blue mine
6	0:00:00.3s	1	3	Blue mine
7	0:00:00.4s	1	4	Blue mine
8	0:00:00.5s	1	5	Blue mine
9	0:00:00.6s	1	6	Red comet

Header Row

The header row defines the button you press to start the show. You can optionally define a second confirmation button, channel and return channel, explained below.

	A	B	C	D	
1	#Trigger Channel	#Trigger Button	#Confirmation Button	#Return Channel	**header row**
2	1	1		1	
4	0:00:00.1s	1	1	Blue mine	
5	0:00:00.2s	1	2	Blue mine	
6	0:00:00.3s	1	3	Blue mine	
7	0:00:00.4s	1	4	Blue mine	
8	0:00:00.5s	1	5	Blue mine	
9	0:00:00.6s	1	6	Red comet	

- **Trigger Channel** (*optional*) - By specifying a channel, the script will only execute if the operator has the same channel set on the 18R2 when firing. By not specifying a channel, the same script will execute on all channels.

- **Trigger Button** - The button you press to execute the script. Supported values including 1 through 18, AUTO-FIRE and STEP. If a Trigger Confirm Button is defined (see below), a user must first press the Trigger

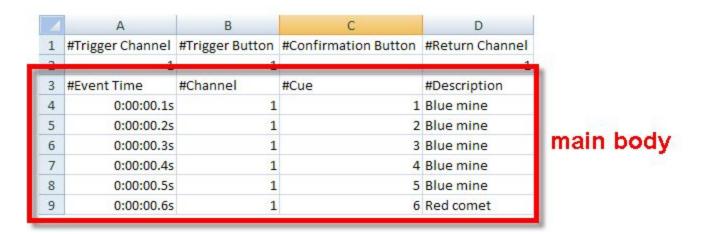Button followed by the Trigger Confirm Button in order to execute the script.

- **Confirmation Button** (*optional*) - An optional 2nd button the user must press in order to execute the script. Supported values including 1 through 18, AUTO-FIRE and STEP. If no confirmation button is specified, the script will execute automatically when the Trigger Button is pressed.

- **Return Channel** (*optional*) - By specifying a return channel, the 18R2 will automatically change to this channel when the script finishes. By not specifying a value, the channel will remain on the last event's channel.

In our example script, the header row for our example program is as follows. Note that we have assigned cue #1 with no confirmation button only for channel 1. When the operator presses cue #1 on channel #1, the script will execute.

Let's proceed to the main body.

Main Body

The main body defines each event executed by the script. Each event contains an event time, channel (optional) and cue, explained below.

	A	B	C	D	
1	#Trigger Channel	#Trigger Button	#Confirmation Button	#Return Channel	
		1	1		1
3	#Event Time	#Channel	#Cue	#Description	
4	0:00:00.1s	1	1	Blue mine	
5	0:00:00.2s	1	2	Blue mine	
6	0:00:00.3s	1	3	Blue mine	main body
7	0:00:00.4s	1	4	Blue mine	
8	0:00:00.5s	1	5	Blue mine	
9	0:00:00.6s	1	6	Red comet	

- **Event Time** - The exact time on which the event will execute. The time format is as follows: hh:mm:ss.[0-9] where hh is hours (e.g. 00 is 0h), mm is minutes (e.g. 01 is 1m), ss is seconds (e.g. 01 is 1s), and [0-9] which represents a 1/10th second increment. The time begins when the operator presses the button. Therefore, if you wish the first even to occur immediately, you'll want to start with 00:00:00.0.

  The formatting is fairly loose, and does not require all values. For example, for 1.5s you can use 1.5. You don't need to enter the full 00:00:01.5 value.

  Please see below for some example event times:

  - 1.5 seconds - 1.5
  - 30 seconds - 30.0
  - 1 minute and 30 seconds - 1:30.0
  - 5 minutes, 12.2 seconds - 05:12.2
  - 1 hour, 10 minutes and 1.3 seconds - 01:10:01.3

  Note: You must also always specify a 1/10th second decimal value. For example, 1s cannot be stated as simply 1. It must be stated as 1.0. Negative values are not accepted.

- **Channel** (*optional*) - The channel on which the event should occur. If a channel is not specified, then the Header Row channel will be used.

- **Cue** - The cue # to fire.

- **Description** (*optional*) - An optional description. For example, Blue Mine.

In our example script we will have 6 separate actions, one for each cue #1-6 with a 0.1s delay between.

Raw File
Below provides an example of the raw contents of the file.

```
#Trigger Channel,#Trigger Button,#Confirmation Button,#Return Channel
1,1,,1
#Event Time,#Channel,#Cue,#Description
0:00:00.1s,1,1,Blue mine
0:00:00.2s,1,2,Blue mine
0:00:00.3s,1,3,Blue mine
0:00:00.4s,1,4,Blue mine
0:00:00.5s,1,5,Blue mine
0:00:00.6s,1,6,Red comet
```

Note: The information rows started by a # symbol are not required. You can manually add any rows into the file starting with the # symbol to insert a comment.

STEP Scripting
STEP scripting allows you to define events that require the user to press the STEP button to fire the event vs. firing automatically based on an event time. STEP scripts are popular for shows without music whereby you are firing back and forth between different modules on different channels vs. a tradition channel 1, cue 1, then channel 1, cue 2, then channel 1 cue 3, etc... Instead, you may fire channel 1, cue 1, then channel 3, cue 1, then channel 2, cue 4, etc... By pre-defining the order of your STEP script, you don't need to watch the remote or change channel manually as you fire the show. You can also fire multiple channels at the same time, and even embed timed events into your STEP script.

See below for a few examples:

Example 1: Simple STEP script w/ no timed events

#Trigger Channel,#Trigger Button,#Confirmation Button,#Return Channel
1,1,,1
#Event Time,#Channel,#Cue,#Description
STEP,1,1,Blue mine
STEP,2,1,Blue mine
STEP,3,1,Blue mine
STEP,1,2,Blue mine
STEP,2,2,Blue mine
STEP,3,3,Red comet

Example 2: Simple STEP script w/ firing multiple channels at the same time
Note: Cues 2 on channels 1, 2, and 3 will fire at the same time

#Trigger Channel,#Trigger Button,#Confirmation Button,#Return Channel
1,1,,1
#Event Time,#Channel,#Cue,#Description
STEP,1,1,Blue mine
STEP,2,1,Blue mine
STEP,3,1,Blue mine
STEP,1,2,Blue mine
00:00:0.0s,2,2,Blue mine
00:00:0.0s,3,2,Red comet

Example 4: Simple STEP script w/ simple embedded time event
Note: Fires cue 2 on channel 1, followed by cue 2 on channel 2, and cue 2 on channel 3 with a 1s delay between them

#Trigger Channel,#Trigger Button,#Confirmation Button,#Return Channel
1,1,,1
#Event Time,#Channel,#Cue,#Description
STEP,1,1,Blue mine
STEP,2,1,Blue mine
STEP,3,1,Blue mine
STEP,1,2,Blue mine
00:00:1.0s,2,2,Blue mine
00:00:2.0s,3,2,Red comet

Example 3: Simple STEP script w/ simple embedded time event
Note: Fires cue 2 on channel 1, followed by cue 2 on channel 2, and cue 2 on channel 3 with a 1s delay between them. Then, STEPs across cues 4 on channels 1, 2 and 3, followed by another small sequence. Notice the time resets back to 00:00:0.0s when the second time event starts. If you want an event to fire at the same time as the previous step event, use the time 00:00:0.0s.

#Trigger Channel,#Trigger Button,#Confirmation Button,#Return Channel
1,1,,1
#Event Time,#Channel,#Cue,#Description
STEP,1,1,Blue mine
STEP,2,1,Blue mine
STEP,3,1,Blue mine
STEP,1,2,Blue mine
00:00:1.0s,2,2,Blue mine
00:00:2.0s,3,3,Red comet
STEP,1,4,Blue mine
STEP,2,4,Blue mine
STEP,3,4,Blue mine
00:00:1.0s,1,5,Blue mine
00:00:2.0s,2,5,Blue mine
00:00:3.0s,3,5,Red comet

Multiple Scripts in a Single File
The COBRA18R supports multiple scripts within a single file. This allows you to execute multiple scripts at different times during your show by pressing different buttons on different channels.

Note: Although the 18R2 supports multiple scripts. You can only execute one script at a time. You can, however, fire cues manually while a script is executing. Also, the unlimited channel support is only applicable for the 1st script in the file. All other subsequent scripts abide by error #22 (no more than 2 channels in a 0.4s time period). See the error codes at the end of this document for more information.

To load multiple scripts, simply add a new header row and main body after the current example script. The following shows an example of two scripts in a single file. The first script is executed by pressing cue #1 on channel 1. The second script is executed by pressing cue #2 on channel 1.

	A	B	C	D
1	#Trigger Channel	#Trigger Button	#Confirmation Button	#Return Channel
2	1	1		1
3	#Event Time	#Channel	#Cue	#Description
4	0:00:00.1s	1	1	Blue mine
5	0:00:00.2s	1	2	Blue mine
6	0:00:00.3s	1	3	Blue mine
7	0:00:00.4s	1	4	Blue mine
8	0:00:00.5s	1	5	Blue mine
9	0:00:00.6s	1	6	Red comet
10	#Trigger Channel	#Trigger Button	#Confirmation Button	#Return Channel
11	1	2		1
12	#Event Time	#Channel	#Cue	#Description
13	0:00:00.1s	1	1	Blue mine
14	0:00:00.2s	1	2	Red comet
15	0:00:00.3s	2	1	Blue mine
16	0:00:00.4s	2	2	Red comet
17	0:00:00.5s	3	1	Blue mine
18	0:00:00.6s	4	2	Red comet

First script Ch. 1, Cue 1 (rows 1–9)

First script Ch. 1, Cue 2 (rows 10–18)

Option 2 Finale Fireworks: Finale Pro (www.finalefireworks.com) is professional visual scripting software for creating both musical and non-musical firework shows. When designing your show in Finale Pro, you can choose to export the show into the required COBRA 18R2 .csv file format. See http://www.finalefireworks.com/features/exporttocobra for additional information.

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When using Finale, we can provide some important "things to know", tips and suggestions from users. You can additionally contact Finale at service@finalefireworks.com for any questions about service plans or additional features made available in their Business edition.

- Set your default firing system from File > Preferences > Default Firing Systems > Cobra 18R2

- Set your show firing system from Show > Set Firing Systems > COBRA 18R2

- If you installed Finale Fireworks earlier than 2013, make sure to download the most recent version of Finale from the Finale Fireworks website News and Announcements section. Simply click on the most recent pre-release and install the most recent version.

- If you are using the COBRA firmware 2.1.1 or earlier, there is a restriction of firing only up to 2 channels in a 0.4s time period. To allow for a seamless integration between Finale and COBRA, we suggest upgrading your units to the 3.0+ firmware. This eliminates the 2 channel restriction and allows you to take full advantage of Finale's automatic address / pin assignment functionality.

- When exporting scripts from Finale, make sure to name the file "cobra" without the quotes. Also, choose "COBRA 18R2" to have the script start at time = 0.0s. If you choose "COBRA 18R2 Semi Automatic", the script start time will start on the first cue, which will cause for misalignment in your script and audio file. The "Semi Automatic" mode is only applicable if you use tracks, explained below.

- By default, Finale exports your show to begin on channel 00, cue 01 with no trigger confirmation button.

- Finale Pro supports "Tracks" which enable you to divide your show into multiple sections. For example, if your firing a non-musical show you may want to split your show into several sections that you start manually with a separate button. To use tracks, simply enter a "Trk" value for every event in the Firing View (<ctrl> + F). You can start with track 1, then track 2, etc... Upon export, Finale will assign the first track to channel 00, cue 01 followed by channel 00, cue 02, followed by channel 00, cue 03, etc... Although the 18R2 supports up to 100 individual scripts, a maximum of 18 tracks are supported when exporting to the 18R2 from Finale Pro.

- Finale provides valuable show reports File > Print report. If you plan on using tracks, we suggest printing the Sequence cue sheet as it includes a separate section for each track.

Upload Script File into the COBRA 18R2

Now that your script is complete, you are ready to import the file into your COBRA 18R2.

Before proceeding, make sure you have performed the following:

- When saving your Excel File, make sure to save as a csv file (comma separated value) named **cobra.csv**. The COBRA 18R2 will only recognize this exact filename.

- Save the file to a USB flash drive. Do not save the file into a directory, rather just drag and drop the file into the root directory of the flash drive. See below.

  Note: We recommend saving copies of your script files on your computer with different file names. When your ready to load the file into the COBRA 18R2, simply rename the file to cobra.csv and save to the flash drive.

You are now ready to upload the script file into the COBRA 18R2. To perform this, simply plug the USB flash drive into the COBRA 18R2. If there are no errors, then the 18-cue LED grid will display all green. If there are errors in your file, the 18-cue LED grid will display all red and the error code(s) / line number will display / rotate on the script timing display.

For example, Er 21 followed by 110 means there is an error code 21 on line 110.

If you see Er4 displayed on the remote, then you don't have the word "end" on the last line of your file.

The following provides a listing of all possible error codes:

Error Code	Description	Resolution
01	COBRA.CSV file not found	Make sure the file name is cobra.csv. Note that in Microsoft Windows sometimes the file will show only as cobra as the type is recognized as a CSV file and the extension is not shown. If you see "cobra.csv", change this to simply "cobra" and you will likely resolve your issue.
02	Error erasing script sector, contact COBRA at info@cobrafiringsystems.com.	There is likely a memory failure on the 18R2 flash chip. Contact info@cobrafiringsystems.com or call Scott Smith at 518-858-1082.
03	Maximum scripts reached. Currently limit is 100.	Reduce the number of scripts in your file to less than 100.
04	Script header row found with no events	Either remove the script row that contains no events or add events to the script.
05	Events found with no script header row	Either remove the event rows that contain no script header row, or add a script header row above the events.
06	Maximum events reached (limit 1,000) for a single script	Reduce the number of events to less than 1,000.
07	Invalid event line format (couldn't find three or more arguments, i.e. two commas)	See *Creating an Example Script* File earlier in the document for more information in defining event rows.
08	Invalid event time format	See *Creating an Example Script* File earlier in the document for more information in defining event rows.
09	Invalid event hour format	See *Creating an Example Script* File earlier in the document for more information in defining event rows.
10	Invalid event minute format	See *Creating an Example Script* File earlier in the document for more information in defining event rows.
11	Invalid event second format	See *Creating an Example Script* File earlier in the

		document for more information in defining event rows.
12	Invalid event channel format	See *Creating an Example Script* File earlier in the document for more information in defining event rows.
13	Invalid script header row return to channel format	See *Creating an Example Script* File earlier in the document for more information in defining header rows.
14	Script header row trigger channel or event channel out of range	The script event channel must be a number no less than 0 or greater than 99.
15	Script header row return channel out of range	The script return channel must be a number no less than 0 or greater than 99.
16	Invalid event cue format	See *Creating an Example Script* File earlier in the document for more information in defining event rows.
17	Event cue out of range	The script event cue must be a number no less than 1 or greater than 18.
18	Missing script header row trigger button	See *Creating an Example Script* File earlier in the document for more information in defining script header rows.
19	Invalid script header row trigger button format	See *Creating an Example Script* File earlier in the document for more information in defining script header rows.
20	Invalid script header row trigger confirmation button format	See *Creating an Example Script* File earlier in the document for more information in defining script header rows.
21	Script event out of order	The event occurs earlier than a previously defined event. All event rows in the file must be in the order of time.
22	More than three overlapping channels in 0.4s	You are attempting to fire more than 2 channels in a 0.4s time-period. You need to add some delay between these events such not to violate this requirement. **Note:** If you are using the COBRA firmware 2.1.1 or earlier, there is a restriction of firing only up to 2 channels in a 0.4s time period. To allow for a seamless integration between Finale and COBRA, we suggest upgrading your units to the 3.0+ firmware. This eliminates the 2 channel restriction and allows you to take full advantage of Finale's automatic address / pin assignment functionality.
23	Invalid event row description	The event row description contains too many characters (max 540) or commas (max 10).
24	Too many columns in event row	The event row contains too many columns (max 20). This is likely due to too many commas in your

		event description.

Additional Information

- The scripts are imported in the order they exist in the script file. If multiple scripts are executed by the same button commands, the first script will be saved and executed. All other scripts will be ignored. For example, if you have script A with a trigger button as cue #1 and a channel 01, and you have script B with a trigger button as cue #1, but no channel. When the operator is on channel 01 and they press cue #1, script A will execute even though script B satisfies the button pressing criteria since it existed earlier in the script file.

- If a script has a trigger button and confirmation button, the operator can press both buttons at the same time to execute the script. The operator does not have to press and release the trigger button before pressing the confirmation button.

- The 18R2 currently supports the ability to manually fire cues while a script is running. However, if you fire cues manually at the same time the script is scheduled to fire a cue, it is possible the complete set of redundant firing commands for the manually fired cue may not be sent. Therefore, this may reduce the reliability of manually fired cues while a script is running.